

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant(s): Backes Examiner: Ewart

Serial No. : 10/781,228 Group Art No. : 2683

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Title : Transmission Channel Selection Apparatus

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S BRIEF PURSUANT TO 37 C.F.R. § 1.192

This Appellant's brief is hereby submitted in accordance with a Notice of Appeal filed April 24, 2006.

I. Real Party in Interest

The real party in interest is Propagate Networks Inc.

II. Related Appeals and Interferences

Appellants are not aware of any appeals or interferences that are related to this application.

III. Status of the Claims

Claims 1-3 are pending in the application, and were subject to final rejection. No claims have been allowed or withdrawn from consideration. The rejections of claims 1 through 3 is being appealed.

IV. Status of Amendments

This is an appeal of the Final Office Action dated February 22, 2006. No Amendments were filed subsequent to the Final Rejection.

V. Summary of Claimed Subject Matter

The subject matter of independent claims 1 and 2 is an apparatus for selecting a channel in a wireless network. The claimed apparatus includes a device capable of automatically selecting one of a plurality of radio frequency channels for communication with other devices such that interference with other devices is reduced because, prior to utilizing the selected channel for normal communications, the selection of the radio frequency channel is communicated to

other devices on the selected channel via a message indicative of an intent to utilize the selected channel. By sending the message indicative of intent to utilize the channel before commencing normal communications the apparatus provides other devices with both notice and opportunity to object to use of the channel.

The specification describes each element of the claims in detail. A basic service set (“BSS”) of a wireless local area network (“WLAN”) typically consists of an access point (“AP”) and a plurality of mobile stations (“STAs”). As taught in the specification, “[b]efore a newly added AP 12 starts to ‘Beacon’ (i.e. broadcast management packets to other APs and STAs), the AP 12 … selects a channel in each band¹, … **advertises its intention to use the selected channel by periodically transmitting DRCP Claim messages during the claiming period (step 42)**²,” (emphasis added) and “if at the end of the claiming period, the AP has succeeded in claiming the selected channel, it begins running on the channel,” and then “[t]he AP starts beaconsing.³” If at the end of the claim period a Channel Selection Collision is detected, then the AP selects another channel if the collision is with a non-DRCP-active AP, or the conflict is resolved via MAC address comparison if the collision is with a DRCP-active AP.⁴ Note also that Figure 5, step (44), is “listen for beacons **and** DRCP claim and announce messages,” (emphasis added) which illustrates that DRCP claim and announce messages are different from beacons. Note also in Figure 5 that final step (60) is “begin beaconsing on selected channel, proceed to AP optimization phase,” which

¹ Specification, page 19, second full paragraph

² Specification, page 19, second full paragraph

³ Specification, page 21, 1st full paragraph

⁴ Specification, page 20

illustrates that the intent message is sent **before** beaconing and commencing normal communications. Commencement of the AP optimization routine is indicative that the AP has commenced “running on the channel,” and hence the AP was not running on the channel during the claim period.⁵

VI. Grounds of Rejection to be Reviewed on Appeal

- A. Claim 1 stands rejected as being anticipated under 35 U.S.C. 102(e) by U.S. Patent Publication No. 2003/0002456 of Soomro et al. ("Soomro").
- B. Claim 2 stands rejected as being rendered obvious under 35 U.S.C. 103(a) by Soomro in view of U.S. Patent Publication No. 2002/0188723 of Choi et al. ("Choi").

The grounds of rejection of claims 1 and 2 to be reviewed on appeal are whether the beacon taught by Soomro satisfies the claimed limitation of a message indicating an intent to utilize a channel, as asserted in the rejections. The secondary reference Choi was not asserted by the Examiner as teaching or suggesting the intent message. Claim 3 is a dependent claim which stands or falls with claim 2.

VII. Argument

A. The intent-to-use message of claim 1 is patentably distinct from the Soomro beacon.

It is well established that "[a]nticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W.L. Gore*

⁵ See Specification, page 28, section 1. AP Optimization

& Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). The rejection of claim 1 under 35 U.S.C. 102 fails to meet this requirement since Soomro does not include the claimed limitation of “prior to utilizing the selected channel for normal communications the selection of a radio frequency channel is communicated on the selected channel to other devices via a message indicative of an intent to utilize the selected channel.”

The Examiner asserts that the Soomro beacon meets the limitation based on an assumption that it is sent prior to normal communications and indicative of an intent to use a channel. However, the Soomro beacon is not indicative of an intent to utilize a channel, but rather is indicative of actual use of a channel as part of normal communications. It is well known in the art that an access point periodically broadcasts beacons as part of normal communications including a traffic map indicating availability of buffered packets.⁶ The purpose of the beacon is to awaken nodes associated with the AP that are in sleep mode in order to resynchronize them so that those nodes can receive the buffered data from the AP.⁷ Soomro describes the format of such a beacon as including “timestamp, a beacon interval, capability information, service set identification (SSID), an identification of supported rates, a frequency hopping (FH) parameter set in frames from stations utilizing frequency-hopping physical (PHY) layer, a direct sequence (DS) parameters in frames from stations utilizing direct sequence (DS) parameters in frames from stations utilizing direct sequence physical (PHY) layer,

⁶ *Beacon signals: what, why, how, and where?*, Gerasenko, S.; Joshi, A.; Rayaprolu, S.; Ponnavaikko, K.; Agrawal, D.P.; Computer, Volume 34, Issue 10, Oct. 2001, Page(s):108 - 110, at page 108

⁷ Id.

a contention free (CF) parameter set in frames from access points supporting point coordination function (PCF), and an independent basic service set parameter set in frames from stations within an IBSS network ... [and] DFS parameter.”⁸ Apart from the DFS parameter (which does not provide the claimed limitation, nor has the Office made such an assertion), the Soomro beacon appears to be a standard IEEE 802.11 beacon. IEEE 802.11 beacons use a traffic indication map (“TIM”) to convey information about frames buffered by the AP for STAs that are currently in sleep mode.⁹ The Soomro beacon, and IEEE 802.11 beacons in general, are indicative of actual use of a channel because the capability information, traffic map and other fields are only required once actual use of the channel has commenced. It would be nonsensical for an AP to signal to a STA that traffic is buffered for that STA, or that communication service is available to that STA at a particular rate, without having already begun normal use of the channel. If that were the case, the meaning of the resulting beacon would be: *the AP has traffic pending for you, but the pending traffic will not actually be delivered to you.* Further, if a beacon were not part of normal communications then it would not be periodically transmitted to signal the beginning of a new data exchange cycle between the AP and STAs. The only reasonable conclusions that can be drawn from the characteristics of the Soomro beacon, and WLAN beacons in general, are that: (1) the beacon is part of normal communications, rather than something that occurs before normal communications; and (2) the beacon is

⁸ Soomro, paragraph 0027

⁹ IEEE 802.11 Tutorial, Mustafa Ergen, 2002, at page 29

indicative of actual use of the channel rather than an indication of mere intent to use the channel.

Unlike a beacon, the claimed intent message is transmitted prior to commencement of normal communications. A basic service set (“BSS”) of a wireless local area network (“WLAN”) typically consists of an access point (“AP”) and a plurality of mobile stations (“STAs”). In accordance with the invention, before an AP starts to beacon management packets to other APs and STAs, the AP selects a channel¹⁰ and advertises its intention to use the selected channel by periodically transmitting DRCP Claim messages during a claiming period.¹¹ If at the end of the claiming period the AP has succeeded in claiming the selected channel, it begins running on the channel by beaconing.¹² Again, Figure 5, step (44) illustrates that a DRCP claim message is distinct from a beacon by reciting “listen for beacons **and** DRCP claim and announce messages,” (emphasis added). Those skilled in the art will appreciate that in the illustrated embodiment the beacon functions as an objection by another AP to the intent message, rather than an intent message itself. Further, the final step (60) in Figure 5 is “begin beaconing on selected channel, proceed to AP optimization phase,” which illustrates that the intent message is sent before beaconing and commencing normal communications. Commencement of the AP optimization routine is indicative that the AP has commenced “running on the channel,” and hence the AP was not running on the channel during the claim period.¹³ Since the

¹⁰ Specification, page 19, second full paragraph

¹¹ Specification, page 19, second full paragraph

¹² Specification, page 21, 1st full paragraph

¹³ See Specification, page 28, section 1. AP Optimization

beacons are described as different than DRCP claim messages, the DRCP claim messages are not merely beacons. Further, since DRCP claim messages are sent in the claim period, and beaconing only commences following the claim period, DRCP claim messages are not part of normal communications, and beacons are part of normal communications.

It should be noted that one advantage of utilizing the DRCP claim messages as recited in the claims is that the AP can determine whether a new channel is relatively free from traffic before beginning potentially interfering normal communications. It also provides a means for APs already utilizing the channel to object to the intent of the new AP to use the channel. In other words, the AP solicits input from other devices with the Claim messages prior to beginning normal communications on the new channel, and may abandon the intent to utilize the channel if an objection is returned. There is no teaching in Soomro that a device can object to a beacon in the manner described with respect to the DRCP Claim messages.

For the reasons stated above, claim 1 distinguishes Soomro by reciting DRCP Claim Messages as “prior to utilizing the selected channel for normal communications the selection of a radio frequency channel is communicated on the selected channel to other devices via a message indicative of an intent to utilize the selected channel.”

B. The intent-to-use message of claim 2 is patentably distinct from the combination of Soomro and Choi.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

The combination of Soomro and Choi fails to disclose or suggest the claimed limitations of “circuitry operable to transmit messages on the selected channel during a claim interval, at least one message indicative of an intent to utilize the selected channel.” Transmitting the message indicative of an intent to utilize the channel distinguishes Soomro for the reasons already discussed above with regard to claim 1. The Examiner has not cited Choi for teaching the intent message and Applicant finds no such teaching in Choi.

In addition to the reason above, claim 2 distinguishes the cited combination by reciting “circuitry operable to monitor messages on the selected channel during the claim interval for a message from another device indicative of an intent to utilize the selected channel.” The Examiner asserts that these features are taught by Soomro at paragraphs 0008, 0025 and 0027. Paragraphs 0008 and 0027 describe the DFS element, which is part of the beacon.¹⁴ The distinction between a beacon and the claimed intent message (DRCP claim message) has already been discussed above. This distinction is true whether a device is

¹⁴ Soomro at paragraph 0027

transmitting the claim message or receiving the claim message. Since the intent message is sent before a beacon can be sent, the intent message cannot, by definition, be in the beacon. Paragraph 0025 describes how management frames, specifically beacons, are periodically sent to advertise network capabilities. Again, the claimed intent message is sent before a beacon is sent. Further, the intent message advertises an intent to utilize a channel, not networking capabilities. In sum, this rejection is based on another incorrect comparison of a beacon with a DRCP claim message.

Claim 3 is dependent on claim 2. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Claim 3 should therefore also be allowed.

VIII. Conclusion

Appellants submit therefore that the rejections of the present claims under 35 U.S.C. 102 and 103, based on Soomro, and the combination of Soomro and Choi., are improper for at least the reasons set forth above. Appellants accordingly request that the rejections be withdrawn and the case put forward for allowance.

Respectfully submitted,

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Appendix A - Claims

1. (previously presented) A program product for use by a wireless device, the program product comprising a computer readable medium having embodied therein a computer program for storing data, the computer program comprising:

logic capable of automatically selecting one of a plurality of radio frequency channels for communication with other devices, wherein the selection of a radio frequency channel is performed such that radio frequency interference with other devices is reduced, wherein prior to utilizing the selected channel for normal communications the selection of a radio frequency channel is communicated to other devices on the selected channel via a message indicative of an intent to utilize the selected channel.

2. (previously presented) A program product for selecting an operating channel by a wireless device, the program product comprising a computer readable medium having embodied therein a computer program for storing data, the computer program comprising:

logic operable to scan each of a plurality of radio frequency channels during a scan interval for indication of utilization of ones of the channels;

logic operable to receive messages on the plurality of radio frequency channels during the scan interval;

logic operable to maintain a channel map having an entry for each of the plurality of radio frequency channels, and if one or more messages was received on a channel, the

corresponding entry further including a device ID for at least one of the devices that sent a message on the channel;

logic operable to select a channel from the channel map based at least in-part on whether an indication of utilization of the selected channel was detected;

logic operable to transmit messages on the selected channel during a claim interval, at least one message indicative of an intent to utilize the selected channel;

logic operable to monitor the selected channel during the claim interval for a message from another device indicative of an intent to utilize the selected channel; and

logic operable to ascertain whether the wireless device should commence communications with other devices on the selected channel based upon characteristics of any messages received on the channel.

3. (original) The program product of claim 2 wherein the logic for maintaining a channel map further stores a power level for each device ID for each entry in the channel map, and wherein the logic for selecting a channel from the channel map selects a channel having either no device ID or a device ID that has the lowest stored power.

Appendix B - Evidence Submitted

None.

Appendix C - Related Proceedings

None.

Appendix D - Cited Documents

Beacon signals: what, why, how, and where?, Gerasenko, S.; Joshi, A.; Rayaprolu, S.;
PonnavaiKKO, K.; Agrawal, D.P.; Computer, Volume 34, Issue 10, Oct. 2001.

IEEE 802.11 Tutorial, Mustafa Ergen, 2002.

(Complete copies submitted with this Brief)